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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/998,535	11/28/2001	Hideyuki Morita	09952-064001	5379
27572	7590	08/24/2005	EXAMINER	
HARNESS, DICKEY & PIERCE, P.L.C.			HAILE, FEBEN	
P.O. BOX 828			ART UNIT	
BLOOMFIELD HILLS, MI 48303			PAPER NUMBER	

2663

DATE MAILED: 08/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

✓

Office Action Summary	Application No. 09/998,535	Applicant(s) MORITA ET AL.	
	Examiner Feben M. Haile	Art Unit 2663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |
- 11/28/2001 & 12/14/2004

DETAILED ACTION

Claim Objections

1. Claim 1 is objected to because of the following informalities: on page 20 line 16, one of the words "**the**" should be deleted. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-7 and 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Derryberry et al. (US 6,728,307), hereinafter referred to as Derryberry.

Regarding claim 1, Derryberry discloses a CDMA communication terminal for communicating with an adaptive array antenna communication system having first second antenna elements (**figure 1 unit 100; column 4 lines 10-15; an adaptive array system with a plurality of antennas using CDMA**), data generating means for generating data signal for each antenna element (**figure 1 unit 146; a data input for each antenna**), multipliers for obtaining a first weighted signal by multiplying a first weight with the data signal for one antenna element and obtaining a second weighted signal by multiplying a second weight with the data signal for the other antenna element (**figure 1 units 134, 136 & 138; weight values are applied to the data inputs**),

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adders adding obtaining a second obtaining a first sum signal by weighted signal and a first known signal and sum signal by adding the second weighted signal and a second known signal (**figure 1 units 140 & 142; the multiplied data is summed with pilot data**), and transmission means for transmitting sum signal from the antenna element and transmitting the second sum signal from the second antenna element (**figure 1 units 116 & 118; the summed data is transmitted by separate antennas**), the CDMA communication terminal comprising: reception means for receiving transmission signals transmitted from the first and second antenna elements through plural reception paths (**figure 1 unit 102; a mobile station receives the summed data**); phase difference calculating means for calculating phase difference data indicating a phase difference between the first and second known signals according to the plural reception paths as update data for updating the first and second weights (**figure 1 unit 128; a weight encoder calculates phase information using the weight values for data received from each antenna**).

Regarding claim 2, Derryberry discloses wherein phase difference calculating means calculates phase difference of the first and second known signals for each reception to determine the phase difference data (**figure 1 unit 128; a mobile station calculates phase information for data received from each antenna of a base station**).

Regarding claim 7, Derryberry discloses a base station for communication with a mobile station, the base station comprising (**figure 1 unit 112; a base station communicates with a mobile station**): first and second antennas for transmitting a

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code-spread RF signal from each antenna (**figure 1 units 116 & 118; two transmitting antennas**); and receiving antenna receiving from the mobile station phase difference data for each RF signal transmitted from the first and second antennas in order to adjust directivity of the first and second antennas (**figure 1 unit 120; a base station antenna receives phase information from the mobile station**), wherein the phase difference data is calculated from RF-signals transmitted through plural reception paths that are transmission paths of the RF signals (**figure 1 unit 128; the mobile station calculates phase information for data received from each antenna and transmits it to the base station**), and wherein directivity of the antennas is controlled based on the phase difference data calculated from the plural reception paths (**figure 1 unit 114; phase information is received by the base station, decoded and applied to incoming data through multipliers 136 and 138**).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Derryberry et al. (US 6,728,307), hereinafter referred to as Derryberry in view of Jitsukawa et al. (US 2003/0012267), hereinafter referred to as Jitsukawa.

Regarding claim 3, Derryberry discloses the limitations of base claim 1.

However Derryberry fails to teach power comparing means for comparing a received power of the first known signal and a received power the second known signal according to the plural reception paths of the reception means, and obtaining resulting power comparison data as the update data.

Jitsukawa discloses a searcher in a mobile communications receiver that measures the power received by each of the antennas and uses this information to identify timing information for the dispreading and delaying (**page 1 paragraph 0006**).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Derryberry to incorporate the elements taught by Jitsukawa. The motivation being to enable high precision path searches in a wireless terminal employing an array antenna.

Regarding claim 4, Derryberry discloses the limitations of base claim 1.

However Derryberry fails to teach power adding means for determining the received power the first and second known signals each reception path, determining a first power sum by adding the determined received power of the first known signals for each reception path, and determining a second power sum by adding the determined received power of second known signals for each reception path; and comparing means comparing the first power sum and second power sum, and obtaining the resulting comparison data as the power comparison data.

Jitsukawa discloses a searcher in a mobile communications receiver that measures the power received by each of the antennas and uses this information to

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identify timing information for dispreading and delaying (**page 1 paragraph 0006**) and a power amplifier that amplifies the signal (**page 2 paragraph 0015**).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Derryberry to incorporate the elements taught by Jitsukawa. The motivation being to enable high precision path searches in a wireless terminal employing an array antenna.

Regarding claim 5, Derryberry discloses a mobile station for receiving a code-spread RF signal from first and second antennas of a base station (**figure 1 unit 102; a mobile station receives data from a plurality of antennas**), and calculating and returning phase difference data for the RF signals transmitted from the first and second antennas to vary signal directivity to the base station in order to vary at least directivity of an antenna beam transmitted from the base station (**figure 1 unit 128; phase information is calculated at the mobile station and transmitted back to a base station**), the mobile station comprising: means for calculating phase difference data among the plural reception paths returned to the base station from the phase differences calculated by the phase difference calculation means (**figure 1 unit 128; phase information is received by the base station, decoded and applied to incoming data through multipliers 136 and 138**).

However, Derryberry fails to teach the mobile station comprising: data demodulation means demodulating according to the plural reception paths of the RF signals transmitted from the base station; RAKE synthesis means disposed downstream of the data demodulating means for aligning the signal arrival timing at each of the

plural reception paths; phase difference demodulation means for demodulating the RF signals for the plural reception paths of the RF signals transmitted from the base station, the RF signals being demodulated from the RF signals before synthesis by the RAKE synthesis means; and phase difference calculation means for calculating a phase difference for each reception path from the output of the phase difference demodulation means.

Jitsukawa discloses a receiver with a plurality of array antennas with reception circuits for QPSK demodulation (**page 1 paragraph 0004**), a Rake synthesis portion and phase difference estimators for estimating the phase differences among the antenna elements (**page 4 paragraph 0037**).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Derryberry to incorporate the elements taught by Jitsukawa. The motivation being to improve the signal to noise ratio of signals propagating over different paths.

Regarding claim 6, Derryberry discloses a mobile station receiving a code-spread RF signal from first and second antennas of a base station (**figure 1 unit 102; a mobile station receives data from a plurality of antennas**), and calculating and returning phase difference data for the RF signals transmitted from the directivity to the base station order to vary the directivity an antenna beam transmitted from the base station (**figure 1 unit 128; phase information is calculated at the mobile station and transmitted back to a base station**), the mobile station comprising: calculating phase difference data among the plural reception paths returned to the base station from the

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phase differences calculated by the phase difference calculation means (**figure 1 unit 128; the base station uses the phase information calculated from the mobile station for incoming data inputs**).

Derryberry fails to teach mobile station comprising: plurality reception means for demodulation according to demodulation timing for each of the plural reception paths of the RF signals transmitted from the base station; and phase difference calculation means for calculating phase difference for each of the plural path reception means output from the plural means path reception means.

Jitsukawa discloses a receiver with a plurality or array antennas with reception circuits for QPSK demodulation (**page 1 paragraph 0004**) and phase difference estimators for estimating the phase differences among the antenna elements (**page 4 paragraph 0037**).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Derryberry to incorporate the elements taught by Jitsukawa. The motivation being to improve the signal to noise ration of signals propagating over different paths.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

a) Vialle et al. (US 2005/0117660), Wireless Transmission Using an Adaptive Transmit Antenna Array

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b) Kim et al. (US 2005/0037718), Device and Method for Transmitting and Receiving Data by a Transmit Diversity Scheme Using Multiple Antennas in a Mobile Communication System

c) Sano (US 2004/0048593), Adaptive Antenna Receiver

d) Yoshida (US 2002/0187814), Adaptive Antenna Reception Apparatus with Weight Updated Adaptively

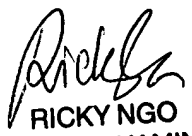
e) Mesecher (US 6,574,265), CDMA Communication System Using an Antenna Array

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Feben M. Haile whose telephone number is (571) 272-3072. The examiner can normally be reached on 6:00am - 3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on (571) 272-3139. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JH 08/18/2005


RICKY NGO
PRIMARY EXAMINER
8/24/05